stage A, comprising hydrogenating diolefins in the feedstock.

16. A process according to claim 14, wherein the feedstock is a catalytic cracking gasoline.

17. A process according to claim 14, wherein stage A is carried out by passing the feedstock, in the presence of hydrogen, over a catalyst comprising at least one element selected from the group consisting of at least one element of group VIII and at least one element of group VIb, said catalyst being at least in part in sulfide form.

18. A process according to claim 17, wherein the element of group VIII, when it is present, is nickel or cobalt, and the element of group VIb, when it is present, is molybdenum or tungsten.

19. A process according to claim 18, wherein stage A is carried out at a temperature of between about 210°C and about 350°C, under a pressure generally between about 1 and about 5 Mpa, with a volumetric flow rate of the liquid of between about 1 and about 10 h^{-1}, and an H_2/HC ratio of between about 100 and about 600 liters.

20. A process according to claim 14, wherein stage C is carried out in the presence of a catalyst comprising at least one base metal selected from the group consisting of nickel, cobalt, iron, molybdenum and tungsten.

21. A process according to claim 20, wherein the base metal content is between 1 and 60% by weight, and said metal is sulfurized.

22. A process according to claim 14, wherein stage C is carried out at a temperature of between about 200°C and about 350°C, a pressure of between about 0.5 and about 5 Mpa, a liquid volumetric flow rate between about 0.5 and about 10 h^{-1} and an H_2/HC ratio of between

between about 100 and about 600 liters per liter.

23. A process according to claim 14 implemented with at least two separate reactors, not including a feedstock pretreatment reactor, whereby the first reactor contains catalyst for stage A and the second reactor contains at least catalyst for stage C.

24. A process according to claim 14 implemented with at least two separate reactors, not including a feedstock pretreatment reactor, whereby the first reactor contains at least a portion of the catalyst for stage A and the second at least another portion of catalyst for stage A and also catalyst necessary for stage C.

25. A process according to claim 14, wherein stage B for the elimination of H2S is carried out by adsorption in the presence of an adsorbent mass selected from the group consisting of zinc oxide, copper oxide and molybdenum oxide.

26. A process according to claim 14, wherein H2S is separated using a membrane.

27. A process according to claim 17, wherein stage C is carried out in the presence of a catalyst comprising at least one base metal selected from the group consisting of nickel, cobalt, iron, molybdenum and tungsten.

28. A process according to claim 18, wherein stage C is carried out in the presence of a catalyst comprising at least one base metal selected from the group consisting of nickel, cobalt, iron, molybdenum and tungsten.

29. A process according to claim 27 wherein the catalyst for stage A is different from the catalyst for stage B.

30. A process according to claim 29 implemented with at least two separate reactors,

not including a feedstock pretreatment reactor, whereby the first reactor contains catalyst for stage A and the second reactor contains at least catalyst for stage C.

31. A process according to claim 29 implemented with at least two separate reactors, not including a feedstock pretreatment reactor, whereby the first reactor contains at least a portion of the catalyst for stage A and the second at least another portion of catalyst for stage A and also catalyst necessary for stage C.